WHAT IS CLAIMED IS:

1. A spectral beam combining (SBC) optical system comprising:

a broad-stripe laser diode;

an external resonator cavity comprising:

a mirror located adjacent to a first facet of said broad-stripe laser diode; and

an output coupler, wherein emissions from a second facet of said broad-stripe laser diode are incident on said output coupler, said output coupler outputting a single output beam;

a dispersive element interposed between said broad-stripe laser diode and said output coupler, said dispersive element reflecting a portion of said emissions back into said broad-stripe laser diode;

a collimating optical system interposed between said broad-stripe laser diode and said dispersive element, said collimating optical system spatially overlapping emissions from said broad-stripe laser diode onto said dispersive element;

a spatial filter interposed between said dispersive element and said output coupler; and

means for creating a plurality of pseudo emitters across said second facet of said broad-stripe laser diode with a corresponding lateral spacing between adjacent pseudo emitters, said means located within said external cavity, wherein said means generates wavelength-periodic variations in transmission or reflectivity.

2. The SBC optical system of claim 1, wherein said mirror further comprises a reflective coating applied to said first facet of said broad-stripe laser diode.

3. The SBC optical system of claim 1, wherein said collimating optical system is located a distance from said second facet of said broad-stripe substantially equivalent to a collimating optical system focal length.

4. The SBC optical system of claim 1, wherein said collimating optical system is located a distance from said dispersive element substantially equivalent to a collimating optical system focal length.

5. The SBC optical system of claim 1, further comprising a divergence reducing optical system adjacent to second facet of said broad-stripe laser diode, said divergence reducing optical system reducing divergence in the emissions corresponding to a fast axis of said broad-stripe laser diode.

6. The SBC optical system of claim 1, wherein said spatial filter comprises an aperture.

7. The SBC optical system of claim 6, wherein said aperture is selected from the group consisting of slits, circular apertures and oblong apertures.

8. The SBC optical system of claim 6, wherein an aperture width associated with said aperture forms an image at said second facet of said broad-stripe laser diode less than twice said lateral spacing of adjacent pseudo emitters.

9. The SBC optical system of claim 6, wherein said aperture comprises a slit, and wherein a slit width associated with said slit forms an image at said second facet of said broad-stripe laser diode less than twice said lateral spacing of adjacent pseudo emitters.

10. The SBC optical system of claim 6, wherein an aperture width associated with said aperture forms an image at said second facet of said broad-stripe laser diode less than twice said lateral spacing of adjacent pseudo emitters multiplied by a factor by which the output beam divergence exceeds the diffraction limit.

11. The SBC optical system of claim 6, wherein said aperture comprises a slit, and wherein a slit width associated with said slit forms an image at said second facet of said broad-stripe laser diode less than twice said lateral spacing of adjacent pseudo emitters multiplied by a factor by which the output beam divergence exceeds the diffraction limit.

12. The SBC optical system of claim 1, wherein said pseudo emitter creating means is comprised of a birefringent material.

13. The SBC optical system of claim 1, wherein said pseudo emitter creating means is comprised of an etalon.

14. The SBC optical system of claim 13, wherein said etalon is located between said broad-stripe laser diode and said dispersive element.

15. The SBC optical system of claim 2, wherein said pseudo emitter creating means is comprised of an etalon, said etalon comprising said broad-stripe laser diode, said reflective coating applied to said first facet of said broad-stripe laser diode and a second reflective coating applied to said second facet of said broad-stripe laser diode.

16. The SBC optical system of claim 15, wherein a maximum gain corresponding to said plurality of pseudo emitters is at least 1.5 times higher than a minimum gain corresponding to said plurality of pseudo emitters.

17. The SBC optical system of claim 16, wherein said maximum gain is between 2 and 4 times higher than said minimum gain.

18. The SBC optical system of claim 1, wherein a maximum gain corresponding to said plurality of pseudo emitters is at least 1.5 times higher than a minimum gain corresponding to said plurality of pseudo emitters.

19. The SBC optical system of claim 18, wherein said maximum gain is between 2 and 4 times higher than said minimum gain.

20. The SBC optical system of claim 15, wherein lasing is suppressed at a plurality of minimum gain locations associated with said plurality of pseudo emitters.

21. The SBC optical system of claim 20, wherein said plurality of minimum gain locations correspond to a plurality of wavelengths.

22. The SBC optical system of claim 1, wherein lasing is suppressed at a plurality of minimum gain locations associated with said plurality of pseudo emitters.

23. The SBC optical system of claim 22, wherein said plurality of minimum gain locations correspond to a plurality of wavelengths.

24. The SBC optical system of claim 1, wherein said lateral spacing is at least equivalent to one half of a fundamental mode diameter associated with said external resonator cavity.

25. The SBC optical system of claim 1, wherein said lateral spacing is at least equivalent to a fundamental mode diameter associated with said external resonator cavity.

26. The SBC optical system of claim 1, wherein said lateral spacing is equivalent to at least one half of a fundamental mode diameter associated with said external resonator cavity multiplied by a factor by which the output beam divergence exceeds the diffraction limit.

27. An SBC optical system comprising:

a broad-stripe laser diode;

an external resonator cavity comprising:

a reflective coating applied to a first facet of said broad-stripe laser diode; and

an output coupler, wherein emissions from a second facet of said broad-stripe laser diode are incident on said output coupler, said output coupler outputting a single output beam;

a dispersive element interposed between said broad-stripe laser diode and said output coupler, said dispersive element reflecting a portion of said emissions back into said broad-stripe laser diode;

a collimating optical system interposed between said broad-stripe laser diode and said dispersive element, said collimating optical system spatially overlapping emissions from said broad-stripe laser diode onto said dispersive element;

a spatial filter interposed between said dispersive element and said output coupler, said spatial filter comprising an aperture; and

an etalon for creating a plurality of pseudo emitters across said second facet of said broad-stripe laser diode with a corresponding lateral spacing between adjacent pseudo emitters, said etalon located within said external cavity, wherein an aperture width associated with said aperture forms an image at said second facet of said broad-stripe laser diode less than twice said lateral spacing of adjacent pseudo emitters, wherein a maximum gain corresponding to said plurality of pseudo emitters is at least 1.5 times higher than a minimum gain corresponding to said plurality of pseudo emitters, wherein lasing is suppressed at a plurality of minimum gain locations associated with said plurality of pseudo emitters, and wherein said lateral spacing is at least equivalent to a fundamental mode diameter associated with said external resonator cavity.

28. A method for improving the beam quality of a broad-stripe laser diode, the method comprising the steps of:

forming a plurality of pseudo emitters from an output of the broad-stripe laser diode; and

passing a plurality of emissions corresponding to said plurality of pseudo emitters through an SBC optical system.

29. The method of claim 28, wherein said forming step comprises the step of transmitting the output of the broad-stripe laser diode through an etalon.

30. The method of claim 28, wherein said forming step further comprises the step of laterally spacing said pseudo emitters by at least one half of a fundamental cavity mode diameter.

31. The method of claim 28, wherein said forming step further comprises the step of laterally spacing said pseudo emitters by at least a fundamental cavity mode diameter.

32. The method of claim 28, wherein said forming step further comprises the step of laterally spacing said pseudo emitters by at least one half of a fundamental cavity mode diameter multiplied by a factor corresponding to an amount by which an output beam divergence exceeds a system diffraction limit.

33. The method of claim 28, further comprising the step of selecting a slit width for a slit associated with a spatial filter of said SBC optical system so that an image of said slit projected onto a front facet of the broad-strip laser diode is less than twice a lateral spacing of adjacent pseudo emitters.

34. The method of claim 28, further comprising the step of selecting a slit width for a slit associated with a spatial filter of said SBC optical system so that an image of said slit projected onto a front facet of the broad-strip laser diode is less than twice a lateral spacing of adjacent pseudo emitters multiplied by a factor corresponding to an amount by which an output beam divergence exceeds a system diffraction limit.

35. The method of claim 28, further comprising the step of suppressing lasing at a plurality of wavelengths corresponding to pseudo emitter minimums.